Connecting 8 Bit and 16 Bit Devices To Wide SCSI Adaptec Host Adapters

Mark E. Donaldson

Connecting 8-bit and 16-bit devices to an Adaptec wide host adapter is a straight-forward process once the following basics are understood:

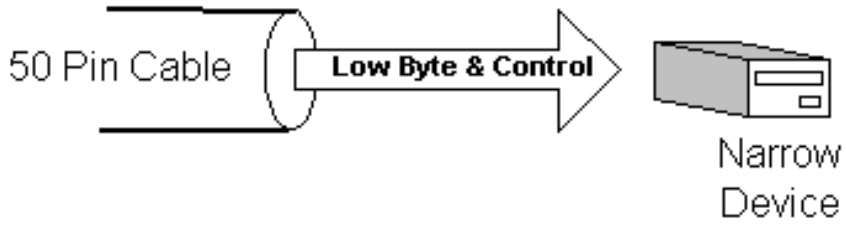
- Signal requirements of narrow devices
- Signal requirements of wide devices
- External converters and how they deal with termination
- Internal converters and how they deal with termination

Eight bit devices are also referred to as narrow devices and 16-bit devices are referred to as wide devices.

Please note that in order to mix wide and narrow devices; a wide host adapter (2740W, 2742W, 2744W, 2940W, 2940UW Mac, 2944W, 2940UW, 3940W, 3940UW, 3940UW Mac, 3940UWD, 3944UWD) is required.

Signal Requirements of Narrow Devices

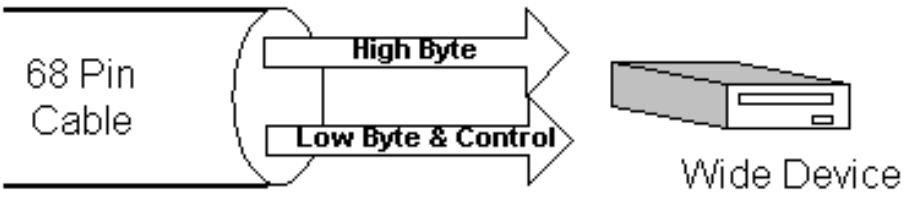
Narrow devices require 50-pin inputs. The signals carried by these 50 pins can be represented as follows:



The Low Byte is sometimes called the Low Data Byte.

Signal Requirements of Wide Devices

Wide devices require 68-pin inputs. The signals carried by these 68 pins can be represented as follows:



The High Byte is sometimes called the High Data Byte.

Adaptec External Converter (ACK-68P-50P-E)

In order to go from a 68-pin external connection to a 50-pin external connection, all that is required is termination of the High Byte. This is what the ACK-68P-50P-E does.

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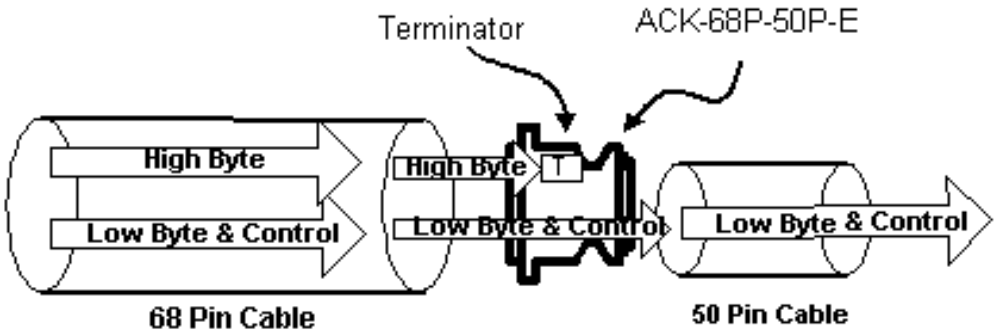


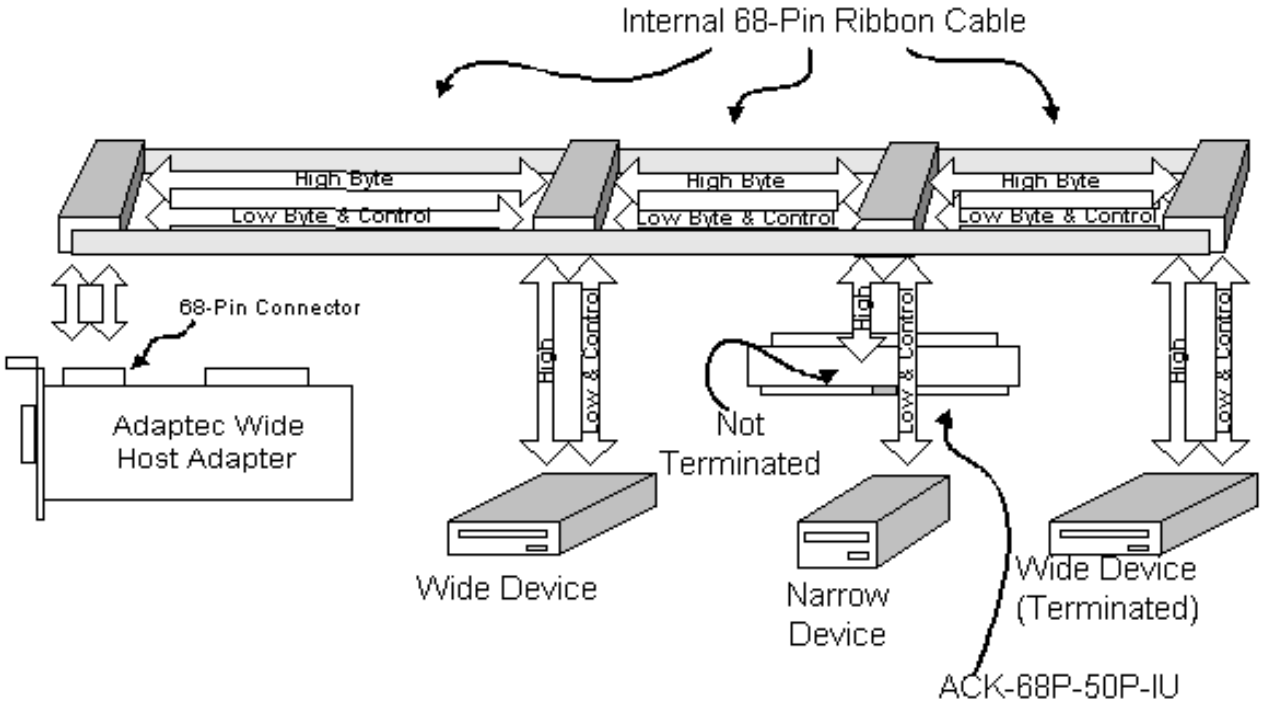
An important consideration should be kept in mind when using the ACK-68P-50P-E:

As drawn above, only 8-bit devices should be used to the right of the converter.

Warning: 68-pin to 50-pin external converters is available from other manufacturers, but only converters that actively terminate the High Byte should be used. 68-pin to 50-pin cables is also available through other manufacturers, but most of these cables do not terminate the High Byte, and should therefore not be used.

Adaptec Internal Converter (ACK-68P-50P-IU)

The ACK-68P-50P-IU is an internal converter that converts a 68-pin ribbon cable connector to a 50-pin connector. The ACK-68P-50P-IU blocks the High Byte, but does not terminate it, because one of the rules of SCSI states that termination may only occur at the end of the bus1. The High Byte is blocked and only the Low Byte and Control signals are fed through the converter.



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The following important considerations should be kept in mind when using the ACK-68P-50P-IU:

- The ACK-68P-50P-IU can be used anywhere along the ribbon cable except on the last connector.
- When an ACK-68P-50P-IU is used, the last device along the ribbon cable must be a wide device that is terminated (Example 3 below) or you must use a ribbon cable that has terminator built into its end (ACK-W2W-5IT) (Example 4 below).
- Several ACK-68P-50P-IU can be used along a ribbon cable.
- Other connectors along the ribbon cable that are not connected to an ACK-68P-50P-IU should be used only with wide devices or remain unused.

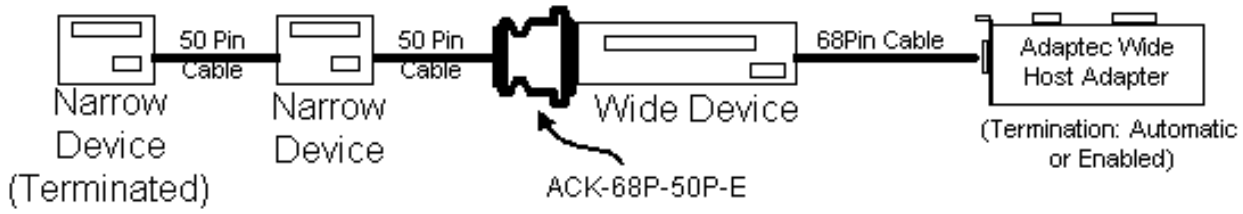
Warning: Internal converters that terminate the High Byte are available from other manufacturers and are useful if the last device must be a narrow device. This type of converter can not be used in the middle of the bus.

Examples

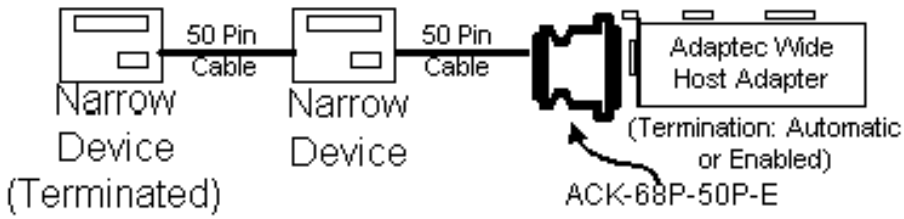
The following are examples of how to connect a SCSI bus with wide and narrow devices. If you have an Adaptec host adapter with auto-termination (2940UW, 2940UW Mac, 3940UW, 3940UW Mac, 940UWD, 3944UWD) it should be left in its default state, Automatic. For host adapters without auto-termination (2740W, 2742W, 2744W, 2940W, 2944W, 3940W) see the termination settings below.

External Devices

Example 1



Example 2



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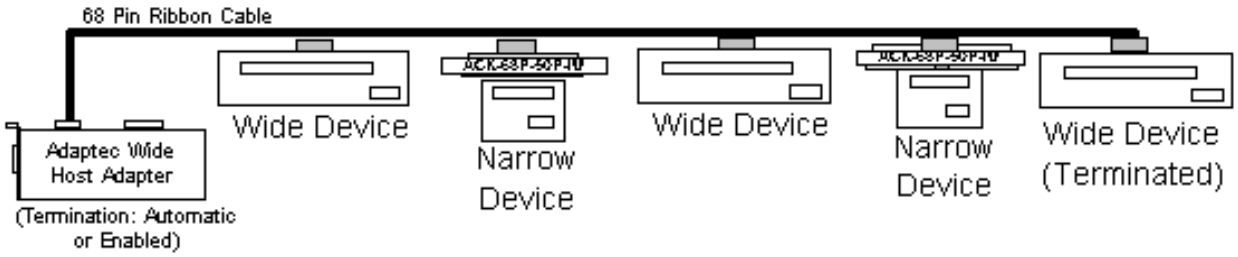
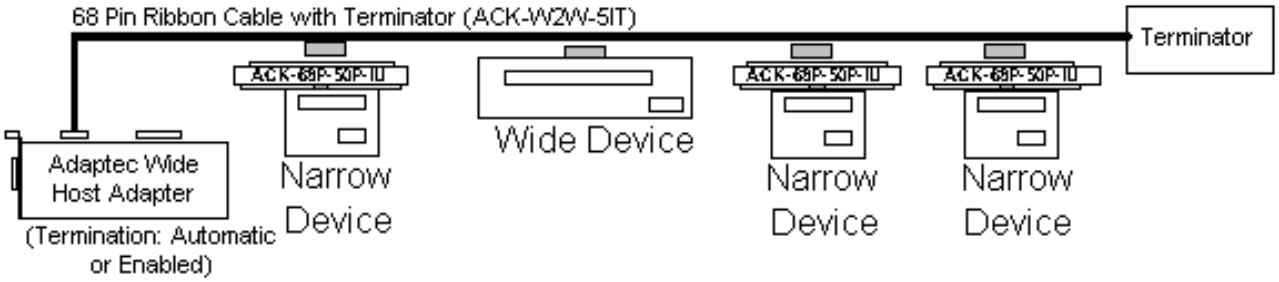
Internal Devices

Example 3

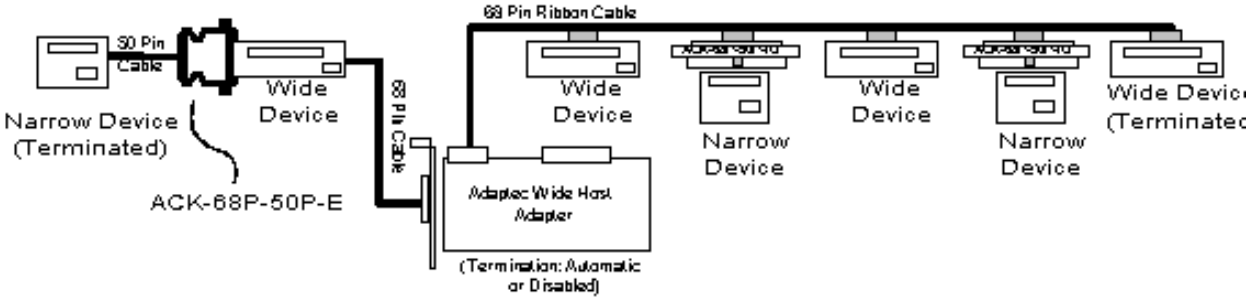


Example 4



Internal and External Devices

Example 5



Caution: Do not connect SCSI devices to all three connectors of an AHA-2940W or AHA-2940UW.